

**United States Department of the Interior
Bureau of Land Management**

DECISION RECORD
Environmental Assessment DOI-BLM-UT-W020-2010-042-EA
March 1, 2011

**Drum Mountains and Whirlwind Valley
Geothermal Exploration Projects**

Location:

T. 14 S., R. 12 W., sec. 1, 3-15, 17-31, 33-35;
T. 15 S., R. 12 W., sec. 3-9, 17, and 18.

Juab & Millard Counties, Utah

Applicant/Address: Ormat Nevada, Inc.
6225 Neil Road, Suite 300
Reno, NV 89511-1136

U.S. Department of the Interior
Bureau of Land Management
Fillmore Field Office
95 East 500 North
Fillmore, UT 84631
Phone: 435.743.3100
FAX: 435.743.3135



DECISION RECORD
Environmental Assessment
DOI-BLM-UT-W020-2010-042-EA
Drum Mountains and Whirlwind Valley Geothermal Exploration Projects
Drum Mountains

It is my decision to approve the Notice of Intent (NOI), serialized as UTU 88138, for Ormat Technologies Inc. to drill 11 temperature gradient, observation and/or production wells with ancillary facilities and access at the Drum Mountains lease area. The Drum Mountains lease area is located west of the Drum Mountains and east of the House Range in Swasey Bottom, T. 14 S., R. 12 W., sections 1, 3 - 15, 17 - 31, and 33 - 35; and T. 15 S., R. 12 W., sections 3 - 9, 17, and 18, Great Salt Lake Base and Meridian (GSLB&M). The Bureau of Land Management (BLM) has analyzed this action in an environmental assessment (EA), DOI-BLM-UT-W020-2010-042-EA, and found that the proposed action also referred to as the selected alternative in this decision will not result in a significant impact to the environment. This decision is in full force and effect per 43 CFR §3200.5(b).

The project area is within Townships T. 14 S., R. 12 W., and T. 15 S., R. 11 and 12 W. at the south end of the Swasey Bottom portion of Whirlwind Valley. The Little Drum Mountains are to the east.

The NOI entails drilling up to three types of geothermal wells at up to 11 well pads; construction or improvement of up to 12,070 feet of access road; two possible access road pull-outs; and two gravel source areas. The maximum total disturbance for these facilities will be approximately 62 acres. The proposed action also allows for construction of temporary personnel camps and up to 3 water wells to be drilled as the source for drilling and dust control water; these facilities will be at either existing geothermal well pads or the gravel source and therefore not add to the maximum total disturbance.

The action proposed in the NOI was presented and analyzed as part of the proposed action in the above referenced EA. No additional mitigation measures have been identified for this action other than those described in the selected alternative. The environmental protection measures described in the selected alternative include the “best management practices from the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development the Gold Book, and will be sufficient because they will avoid and/or minimize potential impacts to a negligible level.

Authorities:

The authority for this decision is contained in 30 U.S.C. § 181 et. seq., Mineral Leasing Act of 1920.

And

30 U.S.C. § 1001 et. seq., Geothermal Steam Act of 1970.

And

43 U.S.C. § 1701 et. seq., Federal Lands Policy Management Act.

Compliance and Monitoring:

Compliance with the lease stipulations for the specific Geothermal Leases covering the lands involved with this project and the Code of Federal Regulations (CFR) at 43CFR 3260 et. seq., Geothermal Drilling will be observed by the Lessee, Operator and BLM during, and through completion of operations.

Monitoring requirements are specified in the stipulations listed under the Terms/Conditions/Stipulations section of this Decision Record. These requirements are intended to maintain impacts at insignificant levels.

Terms / Conditions / Stipulations:

No additional terms, conditions or stipulations have been identified for this action other than those described in the selected alternative. The terms, conditions and stipulations identified in the proposed action are as follows:

- The BLM Central Utah Fire Dispatch (435.896.8404) will be notified immediately of any wildland fire, even if the available personnel can handle the situation or the fire poses no threat to the surrounding area.
- A roster of emergency phone numbers will be available at the project site so that the appropriate firefighting agency can be contacted in case of a fire.
- All vehicles will carry at a minimum, a shovel, five gallons of water (preferably in a backpack pump), and a conventional fire extinguisher.
- Adequate fire-fighting equipment (a shovel, a Pulaski, standard fire extinguisher(s), and an ample water supply) will be kept readily available at each active drill site. Water that is used for construction and dust control will be available for fire suppression.
- Vehicle catalytic converters (on vehicles that will enter and leave the drill site on a regular basis) will be inspected often and cleaned of all flammable debris.
- All cutting/welding torch use, electric-arc welding, and grinding operations will be conducted in an area free, or mostly free, from vegetation. An ample water supply and shovel will be on hand to extinguish any fires created from sparks. At least one person in addition to the cutter/welder/grinder will be at the work site to promptly detect fires created by sparks.
- Personnel will be responsible for being aware of and complying with the requirements of any fire restrictions or closures issued by the BLM West Desert District and Central Utah Fire, as publicized in the local media or posted at various sites throughout the field office district.
- Personnel will be allowed to smoke only in designated areas and will be required to follow applicable BLM regulations regarding smoking.
- Any small fires which occur around the well pad during drilling and/or testing operations should be able to be controlled by rig personnel utilizing on-site firefighting equipment.
- Topsoil will be salvaged, stockpiled, and reused whenever possible and in a timely manner.

- Temporarily disturbed areas will be reseeded where previously vegetated, using a BLM-approved seed mixture.
- Erosion control measures, including but not limited to silt fencing, diversion ditches, water bars, temporary mulching and seeding, and application of gravel or rip rap, will be installed, where necessary, immediately after completion of construction activities to avoid erosion and runoff.
- Access roads will follow existing contours to the maximum extent possible. In areas where new access roads must be constructed across slopes, erosion control measures such as silt fence, surface roughening, and slope stabilization will be provided as necessary.
- An average of six inches of gravel will be used as road surface where appropriate because roads will be used during all seasons.
- Gravel will be laid down when ground conditions are wet enough to cause rutting or other noticeable surface deformation and severe compaction. As a general rule, if vehicles or other project equipment create ruts in excess of four inches deep when traveling cross-country over wet soils, a gravel surface will be added prior to additional vehicle use.
- In areas of very soft soils, up to three feet of aggregate will be used during construction.
- When proposed new access roads must cross ephemeral washes, rolling dips will be installed. The rolling dips will be designed to accommodate flows from at least a 25-year storm event. Culverts may be used wherever rolling dips are not feasible.
- Silt fences and/or straw bales will be used in areas requiring sediment control.
- Roads and well pads not required for further geothermal development purposes will be re-contoured to preconstruction conditions and seeded to prevent erosion.
- Excavation into native soil during construction of well pad reserve pits will be minimized to the extent possible.
- Drill pad reserve pits will be compacted during construction and settled bentonite clay from drilling mud will accumulate on the bottom of the drill pad reserve pits to act as an unconsolidated clay liner, reducing the potential for drilling fluid to percolate to groundwater.
- A BLM-approved cementing and casing program for the drilling of temperature, observation, and production wells will be implemented to prevent water quality effects on groundwater during or after completion of the wells.
- Borehole geophysics analyses (cement bond logs) will be conducted to document that well casing cementing activities provide an effective seal isolating the geothermal aquifer from other aquifers, therefore minimizing potential impacts on surface springs, streams and groundwater.
- The project will use BMPs to ensure that any geothermal fluid encountered during the drilling does not flow uncontrolled to the surface. These include the use of "blow-out" prevention equipment during drilling and the installation of well casing cemented into the ground.

- Any well on the leased land that is not in use or demonstrated to be potentially useful will be promptly plugged and abandoned in accordance with lease stipulations. No well will be abandoned until it has been demonstrated to the satisfaction of the BLM that it is no longer capable of producing in commercial quantities, and will not serve any other useful purpose such as for injection of geothermal fluids or monitoring of the geothermal reservoir or groundwater.
- Trash and other waste products will be properly managed and Ormat will control garbage that could attract wildlife. All trash will be removed from the project areas and disposed of at an authorized landfill.
- Speed limits will be posted, and if necessary speeds will be reduced, especially when wildlife is active near access and service roads.
- Reclamation of the disturbed areas, as described earlier in this document, will be completed in order to return these areas to the condition required in the drilling permit Conditions of Approval.
- Areas that become infested with invasive species/noxious weeds during construction will be mapped and treated, and certified weed-free seed and mulching materials will be used in accordance with lease stipulations.
- Avoid or treat existing weed infestations before disturbance.
- The applicant will not engage in any conduct or activity that allows a “take” (i.e. Harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) of any wildlife. Any “take” or wildlife problems are to be reported to the BLM. All wildlife is to be appreciated and given their space to carry out their biological/ecological activities.
- Employees and contractors will be strictly prohibited from carrying firearms on the job site to discourage “take.”
- The applicant will avoid/minimize any undue or significant impacts to the habitat that will degrade or reduce the function and availability of food, cover, water and space. If habitat is degraded by activities, the applicant will inform the BLM so that possible mitigation measures can be developed to rehabilitate the site.
- The applicant will avoid/minimize impacts to all burrows and washes as much as practical to conduct operations. Washes will be crossed perpendicular to the channel as much as possible.
- All operations will be in conformance with the stipulations / mitigation measures identified within the *December 2008 Oil and Gas Stipulations and Notices for the Fillmore Field Office* (BLM 2008; **Appendix B**). They can be reviewed in their entirety within the Appendices of the Environmental Assessment.
- The migratory bird season extends from May 15 thru July 15. Preferably, operations will occur outside these dates from July 16 thru May 14. If operations occur during the migratory bird season, pre-activity bird surveys will be conducted by a qualified biologist for nesting individuals. If an active nest is identified, a 200 ft. No-activity buffer will be established for the nest site until young have fledged and/or the nest becomes non-active.
- Raptor management will be guided by the use of ‘Best Management Practices for Raptors and Their Associated Habitats in Utah’ (**Appendix C**), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. Generally the spatial buffer is 0.5 miles and extends from Jan. 1 – August 1 for golden eagles and from March 1 – August 1 for

Ferruginous hawks. Smaller species such as burrowing owls and short-eared owls require a 0.25 mile buffer and extends from March 1 – August 31. If operations occur within these periods, surveys will be conducted by a qualified biologist to determine presence; appropriate spatial and temporal buffers will be established if active nests are discovered.

- All lighting will be minimized and directed downward. Insects are attracted to lighting sources which further attracts bats. If any bat mortalities occur, the applicant will contact and report to the BLM wildlife biologist.
- If any fence structures are constructed to protect well heads, structures will be designed to deter any raptor perching.
- Access roads will be surfaced with aggregate materials, wherever appropriate.
- Dust abatement techniques, such as watering on unpaved, unvegetated surfaces to minimize airborne dust, will be used as needed.
- Dust abatement techniques (such as watering, requiring loader buckets to be emptied slowly, and minimizing drop heights) will be applied to earthmoving, excavating, trenching, grading, and aggregate crushing and processing activities.
- Equipment and vehicle idling times will be minimized during construction activities (Emission Standards for Stationary Internal Combustion Engines of 2 g/bhp-hr of NO_x for engines less than 300 HP (Tier 3) and 1 g/bhp-hr of NO_x for engines over 300 HP (Tier 3)).
- Prudent speed limits will be observed on unpaved roads throughout the project areas in order to reduce dust emissions.
- Access roads, project area roads and other traffic areas will be maintained on a regular basis to minimize dust and provide for safe travel conditions.
- Periodic application of water will be used on soil surfaces during construction and grading to control dust.
- Cut and fill areas will be minimized by proper placement of roads and well pads.
- Equipment placed at the well pads will be removed after drilling and testing so that only the wellhead extends above the well pad.
- Drill rig and well test facility lights will be limited to those required to safely conduct the operations, and will be shielded and/or directed in a manner that focuses direct light to the immediate work area.
- Disturbances will be reclaimed to pre-construction conditions.
- Ormat will retain the services of a qualified archaeologist for purposes of conducting a cultural resources survey in all portions of the project areas. Ormat will avoid known eligible and potentially eligible cultural resource sites through design, construction, and operation of the project.
- An approximate 100-foot buffer zone will be established around eligible and potentially eligible cultural resource sites to help provide protection to the sites. Project facilities and disturbance will not encroach into the established 100-foot buffer zone.
- The project facilities will be operated in a manner consistent with the engineered design to prevent problems associated with the run-off that could affect adjacent cultural sites. This includes the use of BMPs to minimize off-site erosion and sedimentation.

- Ormat will limit vehicle and equipment travel to existing and proposed roads, well pad locations, and construction areas, including gravel source areas.
- Any unplanned discovery of cultural resources, items of cultural patrimony, sacred objects or funerary items requires that all activity in the vicinity of the find ceases, and the Field Manager, FFO, 95 East 500 North, Fillmore, Utah 84631, be notified immediately by phone (435-743-3100) with written confirmation to follow. The location of the find will not be publicly disclosed, and any human remains must be secured and preserved in the place until a Notice to Proceed is issued by the authorized officer.
- Existing roads and trails will be used for travel to the maximum extent feasible unless otherwise authorized. During wet road conditions, any ruts deeper than four inches remaining on the roads from the project will be repaired at the Authorized Officer's discretion.
- Generated trash/debris will be removed from public land and discarded at an authorized facility.
- The proposed project will be subject to valid prior existing rights-of-way including county-maintained roads. Holders should be contacted and coordinated with, if the proposed project affects any existing rights-of-way.
- A project hazardous material spill and disposal contingency plan will be prepared that will describe the methods for cleanup and abatement of any petroleum hydrocarbon or other hazardous material spill. The hazardous material spill and disposal contingency plan will be submitted to and approved by the BLM and made readily available onsite before operations begin.
- Secondary containment structures will be provided for all chemical and petroleum/oil storage areas during drilling operations. Additionally, absorbent pads or sheets will be placed under likely spill sources and spill kits will be maintained onsite during construction and drilling activities to provide prompt response to accidental leaks or spills of chemicals and petroleum products.
- Handling, storage, and disposal of hazardous materials, hazardous wastes, and solid wastes will be conducted in conformance with federal and state regulations to prevent soil, groundwater, or surface water contamination and associated adverse effects on the environment or worker health and safety.
- Portable chemical sanitary facilities will be available and used by all personnel during periods of well drilling and/or flow testing. These facilities will be maintained by a local contractor.

PLAN CONFORMANCE AND CONSISTENCY:

Although the HERRA RMP and ROD (BLM 1987) does not specifically provide for geothermal exploration in the Drum Mountains and Whirlwind Valley areas, the proposed action is in conformance with the RMP and ROD because it is clearly consistent with its objectives, terms,

and decisions. Specifically, under the HRRRA RMP, the stated goals of the mineral program are to:

- 1) provide for discovery, development, and use of minerals on public land consistent with applicable laws and regulations;
- 2) require the least restrictive stipulations necessary to adequately protect other resources; and
- 3) Continue to meet public demand for saleable and free-use mineral materials on a case-by-case basis.

Due to a legislative barrier, the HRRRA RMP was not amended by the Geothermal Programmatic EIS (PEIS) (BLM and U.S. Forest Service 2008) but was covered in the area of analysis at that time. The EA incorporates the PEIS by reference, which analyzed the impacts of the exploratory phase of development.

Alternatives Considered:

Only the No Action Alternative was carried forward as an alternative to the Selected Alternative. Specific resource issues have been resolved through modification of the Notice of Intent. Specific resource issues have included the following: Prevention and Control of Fires; Soil Protection Measures; Protection of Water Resources; Protection of Biological Resources; Air Quality Controls; Control of Noise; Visual Resources; Cultural, Archeological, Native American, and other Natural Resources; Realty/Land Access; and Waste Disposal. A second action alternative has not been necessary in resolving these resource issues.

Rationale for Decision:

The No Action Alternative is the only alternative to the Proposed Action in the Drum Mountains and Whirlwind Valley Geothermal Exploration Projects EA. Specific resource issues have been resolved through modification of the Notice of Intent without the need to develop a second action alternative. (See the discussion above listing specific resource issues under the heading of “Alternatives Considered”). In the EA, the No Action Alternative has served as an alternative for comparison to the Proposed Action.

The objective of the Selected Alternative is to allow geothermal exploration with access routes; water wells; gravel sources; temperature gradient, observation, and/or production wells; while still providing for adequate protection of surface resources. The Proposed Action is divided into two areas, the Drum Mountains and Whirlwind Valley. This decision covers the Drum Mountains portion of the project; the key elements of which are, up to a total of 12,070 feet of access road, up to 11 well pads, and up to two gravel pits. The maximum widths of the access routes will be 20 feet. The approximate dimensions of the well pads will be up to 400 feet by 450 feet. The gravel sources will be up to approximately 5 acres each. The maximum total disturbance for this portion of the project will be 62 acres.

The decision to approve the drilling of these geothermal wells is made based on 43 CFR § 3261.20 that allows lessees to legitimately apply to the BLM for geothermal drilling operations when they hold geothermal lease parcels on BLM lands, and based on WO and Utah State Office policy and direction that encourages the leasing of geothermal parcels and the exploration of

geothermal resources within the parcels. The decision to approve the proposed drilling is also based on wording on page 75 of the HERRA RMP (October 1987) which states: “The goals of the minerals program are to: 1) provide for exploration, development, and use of minerals on public land consistent with applicable laws and regulations; 2) require the least restrictive stipulations necessary to adequately protect other resources; and 3) continue to meet public demand for saleable and free-use mineral materials on a case-by-case basis.”

Public Involvement

The initial scoping of the Drum Mountains and Whirlwind Valley Geothermal Exploration Projects was from December 7, 2010 through January 7, 2011 the BLM opened a public scoping of the project on their Environmental Notification Bulletin Board (ENBB). A project description was available on the ENBB during the scoping period the BLM mailed letters to the permittees with the grazing allotments involved at the project sites. The only public response during the scoping period was a letter from the Public Lands Policy Coordination, State of Utah that encouraged the use of “Best Management Processes” in protecting air quality. The comments in the letter were incorporated in the EA. A letter received after the public scoping period ended was received by the Southern Utah Wilderness Alliance; their letter encouraged BLM to comply with Secretarial Order No. 3310 and protecting wilderness characteristics. The preparation of the EA had considered wilderness characteristics and complied with the Secretarial Order and no changes were required. In addition, letters have been sent to the tribes in Utah requesting input on this project.

Protest/Appeal Language:

43 CFR 3200.5(b) states the following: “All BLM decisions or approvals under this part are immediately effective and remain in effect while appeals are pending unless a stay is granted in accordance with 43 CFR 4.21(b).”

This decision may be appealed to the Interior Board of Land Appeals (Board), U. S. Department of the Interior (DOI) Office of Hearings and Appeals, in accordance with the regulations contained in 43 CFR, Part 4. The appellant has the burden of showing that the decision appealed from is in error. If an appeal is taken, a notice of appeal must be filed at the Bureau of Land Management, Fillmore Field Office, 95 East 500 North, Fillmore, UT 84631 within 30 days of either of receipt of the decision if served a copy of the document, or otherwise within 30 days of the date of the decision.

The appeal may include a statement of reasons at the time the notice of appeal is filed, or the statement of reasons may be filed within 30 days of filing this appeal. At the same time the original documents are filed with this office, copies of the notice of appeal, statement of reasons, and all supporting documentation also must be sent to each party named in this decision and to the U. S. DOI Solicitor at the following address:

Field Solicitor,
6201 Federal Building,
125 South State Street,
Salt Lake City, UT 84138–1180;

If a statement of reasons is filed separately from the notice of appeal, it also must be sent to the following location within 30 days after the notice of appeal was filed:

Interior Board of Land Appeals
Office of Hearings and Appeals
4015 Wilson Boulevard
Arlington, VA 22203

This Decision will remain in effect during the appeal unless a petition for Stay is granted or this decision will remain in effect during the appeal unless a petition for stay is filed. If the appellant wishes to file a petition pursuant to regulations at 43 CFR 4.21 for a stay of the effectiveness of this decision during the time that the appeal is being reviewed by the Board, the petition for a stay must accompany the notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. If the appellant requests a stay, the appellant has the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or by other pertinent regulation, a Petition for a Stay of a Decision pending appeal shall show sufficient justification based on the following standards:

- (1) The relative harm to the parties if the stay is granted or denied,
- (2) The likelihood of the appellant's success on the merits,
- (3) The likelihood of immediate and irreparable harm if the stay is not granted, and
- (4) Whether the public interest favors granting the stay.

Authorized Officer

Date